Remarks

The Applicants note with appreciation the acknowledgment of the Applicants' claim of priority and the Applicants' prior Information Disclosure Statement. A new Information Disclosure Statement is submitted based on a recently issued European Search Report. The usual PTO-1449 form is enclosed. The Applicants respectfully request entry of the Information Disclosure Statement into the Official File and consideration thereof.

The Applicants note with appreciation the Examiner's helpful suggestions with respect to Claims 4 and 9. The suggested change has been made to Claim 9. The Applicants have made a change to Claim 4 that is somewhat different from the suggested one. In particular, Claim 4 has been amended to recite that the size of the electrodeposited crystallites is between about 1 and about 25 μm. The "preferably" range has also been removed, inasmuch as it places the claim in improper form. That subject matter has been claimed in new dependent Claim 11, which recites that the size of the electrodeposited crystallites is between 1 and 10 μm. The change to "electrodeposited crystallites" is more accurate than the suggested language of "electrochemically active material."

The substrate material used in accordance with the invention actually has crystallites electrodeposited onto the substrate material. This structure forms the metallic output conductor. In other words, the metallic output conductor comprises the substrate material and the electrodeposited crystallites. After the metallic output conductor is formed, electrochemically active material is applied to the metallic output conductor. The Applicants therefore respectfully submit that it would not be accurate to utilize the suggested "electrochemically active material" since the electrochemically active material is not formed from crystallites and does not have a

crystallite size. In the event that further clarification is deemed necessary, the Applicants would be more than willing to discuss the matter with the Examiner by telephone.

In accordance with the explanation set forth above with respect to Claim 4, the Applicants have also amended Claim 1 in a similar manner. Further, the Applicants have amended Claim 1 to remove "or a substrate sheet" for clarification purposes and now recite the metallic output conductor being formed from a foil or sheet. Similar housekeeping changes to Claims 2, 3 and 5 – 8 and 10 have also been made. Entry of these amendments into the Official File is respectfully requested.

The Applicants acknowledge the rejection of Claims 1 – 3 and 7 – 10 under 35 U.S.C. §102 as being anticipated by Bittihn. The Applicants respectfully submit that Bittihn fails to disclose, either explicitly or implicitly, every aspect of those claims. Bittihn discloses an aluminum substrate with its natural oxide film intact by providing the aluminum substrate with an electron-conducting coating of Au, Pt, Ni, Cr, Cr-Ni or C. This aluminum substrate can be used as an aluminum eliminator. The electron-conducting material for the coating can be applied on the aluminum substrate by vapor deposition or by sputtering. It is also possible to apply the material by spraying or lacquering the aluminum substrate. This is disclosed in Column 3, lines 25ff.

The roughness of the surface of the coating is typically below 1 μm by using such a standard technique. However, the surfaces of that coating are not suitable for this invention in which the contact area of the element is enlarged and the contact resistance to the active material is reduced. In sharp contrast, this invention uses electrodeposition to provide the surface of the coating because the resulting crystallites have a rough surface (greater than 1 μm). For such

rough surfaces only, the contact resistance between the surface and the electrochemically active material is less and stays slow after long storage and thermal cycling.

In that regard, the Applicants invite the Examiner's attention to Column 3, lines 54 – 55. That disclosure makes it clear that the metal film, which is spread over the oxide layer, has to be extraordinarily thin. Clearly, such thin films cannot provide the roughness in accordance with this invention.

As a result of the above, it can readily be seen that the Applicants specifically claim a metallic output conductor which is formed from a foil or sheet as one layer and another layer of electrodeposited crystallites. The resulting metallic output conductor has electrochemically active material applied to it. In sharp contrast, Bittihn discloses an aluminum substrate that has an oxide formed on it. This is sharply different from Claims 1 – 3 and 7 – 10 for a variety of very simple reasons. The electrodeposited crystallites of a second or substantially identical metal are not the same as an oxide layer of the metal. Bittihn clearly discloses that the oxide is a natural oxide film. Such a natural oxide film is neither in the form of crystallites nor is it electrodeposited. Therefore, the natural oxide film is inherently not an electrodeposited crystallite layer. Also, a natural oxide film is not an identical or substantially identical metal. An identical metal is exactly that--an identical metal. An oxide of a metal is not identical to the metal. Also, a substantially identical metal is not an oxide metal. A substantially identical metal still refers to a metal, not a metal oxide. The Applicants accordingly respectfully request withdrawal of the 35 U.S.C. §102 rejection of Claims 1 – 3 and 7 – 10 based on Bittihn.

The Applicants acknowledge the rejection of Claims 1 – 10 under 35 U.S.C. §102 as being anticipated by Nakanishi. Nakanishi discloses a collector plate with a two-layer structure. There is a copper layer and a metal layer, such metal not forming an intermetallic compound

with lithium, and having a lower laser beam reflectivity than copper. However, the collector of Nakanishi has nothing to do with the metallic output conductor defined in the solicited claims.

According to paragraph [0034] of Nakanishi, the copper layer and the metal layer provide opposite surface layers of the collector plate and the copper layer is welded to the edge of the negative electrode. As a consequence, there is no contact between the metal and any electrochemically active material, which is an important aspect of this invention. The metal layer on the copper layer according to Nakanishi has no function in the electrode of the galvanic element. The Nakanishi metal layer only has a function when the copper layer is welded to the negative electrode. This can be seen from paragraph [0048] of Nakanishi. That disclosure states that the laser beam is projected on the surface of the metal layer of low reflectivity so that energy of the laser beam can be fully given to the junction of the collector plate 3 and the edge of the negative electrode 21. Consequently, the plate and the negative electrode edge are welded to each other completely.

The disclosure of Nakanishi is readily understood by reference to Fig. 1. In that regard, we invite the Examiner's attention to Fig. 1 so that the proper context of paragraph [0034] and paragraph [0102] may be fully understood. Unfortunately, Nakanishi uses language that is somewhat confusing if Fig. 1 is not considered.

Paragraph [0102] recites a negative electrode formed by coating a current collector of copper foil with a negative electrode active material comprising natural graphite. However, the current collector of copper foil is not the same as the collector plate 3 referred to in paragraph [0034]. Fig. 1 helps to clarify this. The negative electrode 21, referred to in paragraph [0102], is shown by reference number 21 in Fig. 1. That negative electrode is a copper foil coated with electrode active material 24.

However, the current collector, which is copper foil in negative electrode 21 of Fig. 1, is not the same as the collector plate 3 of paragraph [0034]. Again, Fig. 1 clarifies that. Collector plate 3 is shown in a horizontal orientation that is perpendicular to the vertical orientation of negative electrode 21. Thus, the collector plate 3 comprises, among other things, a copper layer 31 and another type of metal that does not form an inner metallic compound with lithium.

Claim 1 recites a metallic output conductor formed from a foil or sheet having electrodeposited crystallites formed on the foil or sheet. This is what forms the negative electrode which would be positioned in the vertical orientation as shown in Fig. 1 of Nakanishi under reference number 21. The Applicants' metallic output conductor would then have the active material coating still at the same location as negative electrode 21 of Nakanishi.

Unfortunately, the collector 3, which comprises copper layer 31 and some other type of metal 32, is in direct contact with the negative electrode 21 by virtue of welding. However, collector plate 3 is never in contact with the electrochemically active material in Nakanishi. Fig. 1 clearly shows that collector plate 3 is in welded contact with negative electrode 21, but is not in contact with the separator or electrochemically active material. This is further illustrated in Fig. 3 and still further illustrated in Fig. 4, where it can be seen that the active material has a width A which is less than the width of the negative electrode 21. This automatically precludes contact between collector plate 3, which is comprised of the copper layer and another metal layer, with the electrochemically active material.

This is sharply contrasted to the solicited claims which specifically recite that the electrochemically active material is applied to the metallic output conductor, which is formed from the foil or sheet having electrodeposited crystallites on it. As such, Nakanishi fails to

disclose this important aspect of the invention. Withdrawal of the 35 U.S.C. §102 rejection of Claims 1 – 10 based on Nakanishi is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

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